Flexible, open and safe

The made-to-measure motor management system

SIMOCODE pro
Safe and reliable motor management:
SIMOCODE pro takes off

In many automated processes, plant downtimes have proven themselves to be extremely costly.
Costs that can easily be reduced. When the correct technology is applied, faults can either be prevented or when a fault does occur, it can be quickly resolved. For more than 20 years, SIMOCODE has been perfectly mastering these tasks in many low-voltage power distribution boards worldwide.

New market requirements such as the increased application of power management systems or state-based motor monitoring have led to the development of the market’s leading motor management system: SIMOCODE pro.

More powerful, easy to handle and flexible:
SIMOCODE pro – the motor management system
SIMOCODE pro represents the flexible and modular management system for motors in the low-voltage range which can be easily and directly connected to superior automation systems via PROFIBUS or PROFINET.
It covers all functional requirements, including safety-related disconnection, between the motor feeder and the automation system. Furthermore, it combines all required protection, monitoring, safety and control functions for every motor feeder in a single compact system. This facilitates improved process control quality coupled with reduced costs – from system planning to mounting and operation, right down to maintenance.

SIMOCODE pro Safety
Due to new regulations and standards in safety technology, the fail-safe disconnection of motors grows more and more important. With the fail-safe expansion modules, safety technology becomes an integral part of the motor management system. Thus, SIMOCODE pro is standard setter in the implementation of this trend.

Comprehensive motor feeder features

<table>
<thead>
<tr>
<th>Feature</th>
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<tbody>
<tr>
<td>• Multifunctional, electronic full motor protection, independent of the automation system</td>
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<td>• Fail-safe disconnection of motors</td>
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<td>• Integrated control functions</td>
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<tr>
<td>• Detailed operating, service and diagnostics data</td>
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<tr>
<td>• Open communication via PROFIBUS or PROFINET</td>
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**SIMOCODE pro – Highlights**

- Overload protection for motor currents up to 820 A
- Integrated thermistor motor protection
- Integrated earth fault monitoring
- Integrated safety functions for disconnection of motors up to SIL 3/PL e
- Temperature detection (e.g. Pt100/Pt1000/KTY/NTC)
- Voltage detection up to 690 V
- Power and cos-phi/Power Factor
- Analog inputs and outputs
- Communication via PROFIBUS or PROFINET
- Graphical parameterizing interface
- Measuring curves can be recorded/traced
- Device internal error memory/error history
- Integrated web server and OPC UA server
- Removable current transformer
- Initialization module for feeder-related parameter saving
- Global certifications (e.g.: ATEX, UL/CSA, CCC, shipbuilding)
- Energy management function via PROFInergy profile
Advantages in all areas:
SIMOCODE pro connects

- Protecting/monitoring
- Controlling/interlocking
- Fail-safe disconnection
- Data/communications
<table>
<thead>
<tr>
<th>General</th>
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<tbody>
<tr>
<td>• Improved system availability</td>
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<td>• Fault prevention using monitoring of the motor state</td>
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<td>• Faster troubleshooting – faults are resolved using detailed diagnostics data</td>
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<td>• Autonomous functions guarantee the availability of the motor feeder even when communications or supervisory control systems fail</td>
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<tr>
<td>• SIMOCODE pro Safety with integrated safety functions</td>
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<tr>
<td>• Energy management: Transparent detection and visualization of power and energy consumption, including active load management, via the PROFIenergy profile</td>
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<tr>
<th>Process management</th>
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<td>• Higher process transparency and higher information density at the supervisory control level than for conventional solutions</td>
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<td>• All of the process quantities are available</td>
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<tr>
<td>• Unified and seamless integration (Totally Integrated Automation)</td>
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<tr>
<td>• Standardized motor blocks ease integration in the control system and simplify handling</td>
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<th>Operations management</th>
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<tr>
<td>• Reduced maintenance and service costs thanks to the integrated status monitoring</td>
</tr>
<tr>
<td>• Service and maintenance personnel are supported by an extensive range of service and diagnostics data</td>
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<tr>
<td>• Faults can be more easily reconstructed as measuring curves are recorded and faults logged</td>
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<tr>
<td>• Comprehensive operation and diagnostics via integrated web server and communication via OPC UA</td>
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<th>Switchboard</th>
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<tr>
<td>• Flexible and space-saving motor feeders thanks to the small dimensions and modular design</td>
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<tr>
<td>• Communication capability of the motor feeder via integrated PROFIBUS or PROFINET interface</td>
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<tr>
<td>• More functionality in a smaller space when compared to conventional solutions</td>
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<tr>
<td>• Lower wiring costs as the control circuit hardware is replaced by integrated control functions</td>
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<tr>
<td>• Graphic parameterization speeds up commissioning and simplifies plant documentation</td>
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</table>
Functionality as it is needed:

SIMOCODE pro is flexible

We offer you two device series that are functionally harmonized with one another so that you can enjoy the benefits of SIMOCODE pro in all areas of the process industry and power generation:

**SIMOCODE pro C**

The compact motor management system for direct-on-line and reversing starters: The most efficient communication-capable motor management system of its class – with connection to PROFIBUS.

SIMOCODE pro C is thus also particularly suitable for the conversion from conventional to communication-capable motor feeders.

**SIMOCODE pro V**

The variable motor management system: It offers an even larger functional scope which can be additionally expanded by precisely the functions required for your motor feeder – up to five optional expansion modules can be connected. Besides the PROFIBUS version, SIMOCODE pro V is also available with PROFINET interface.

* for SIMOCODE pro V
Comfortable integration via integrated interface

SIMOCODE pro supports the motor feeder’s standardized integration in superior automation systems via PROFIBUS and PROFINET.

**SIMOCODE pro for PROFIBUS supports:**
- Cyclic services (DPV0) and acyclic services (DPV1)
- Comprehensive diagnostics and process alarms
- Fail-safe communication via PROFIsafe*
- Time stamping of digital signals with high temporal accuracy*

**SIMOCODE pro for PROFINET supports:**
- Line and ring bus topologies thanks to integrated switch
- Media redundancy via MRP protocol
- Fail-safe communication via PROFIsafe
- Break function and measured values for energy management via PROFIenergy
- NTP-synchronized time
- Module replacement without PC / memory module via neighborhood detection
- Comprehensive diagnostics and maintenance alarms
- OPC UA server function for open communication with visualization and control systems
- Operating, service and diagnostics data via standard web browser

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The made-to-measure motor management system (fig. for PROFIBUS)
Versatility par excellence:
SIMOCODE pro is extremely versatile

There is a wide range of modules at your disposal so that SIMOCODE pro can provide you with what you need in the field coupled with the most flexible device functionality possible. Below is an overview of the wide range of versions that you can expect now and in the future.

One system for all motor feeders:
Measuring currents up to 820 A

SIMOCODE pro monitors motors with rated motor currents up to 820 A. Various current measuring modules are available. The modular design and the integrated, seamless system allow a significantly easier and flexible integration of the motor feeder.

By the way: Voltage, power and cos-phi/power factor

Current/voltage measuring modules* can be optionally employed instead of the current measuring modules. This facilitates the monitoring of voltages up to 690 V and power-related measuring variables in addition to the motor current.

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**Width 45 mm**

Current measuring modules

| 0.3–3 A; 2.4–25 A |

**Width 55 mm**

Current/voltage measuring modules

| 10–100 A |

**Width 120 mm**

| 20–200 A |

**Width 145 mm**

| 63–630 A |

The matching intermediate 3UF18 current transformers for the current measuring or current/voltage measuring modules are available to measure and monitor motor currents of up to 820 A.

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* for SIMOCODE pro V
Easier handling: The operator panel
The operator panel serves the motor feeder’s control. Installed in a control cabinet door, it features degree of protection IP54. As a result, SIMOCODE pro or the feeder can be directly operated on the control cabinet. The system interface integrated on the operator panel’s front supports eased parameterization and diagnostics via PC / programming device directly on the control cabinet door. The operator panel is optionally available with display* for the indication of measured values and operating and diagnostics data directly on the control cabinet. Furthermore, also parameters such as nominal motor current, limit values, etc., can be directly set via the operator panel with display when using SIMOCODE pro for PROFINET.

It’s your choice:
Expansion modules for SIMOCODE pro V
SIMOCODE pro V not only offers even more protection, control and monitoring functions than SIMOCODE pro C. By using our expansion modules it can also be expanded as required.

Digital modules*
The type and number of digital input and relay outputs of SIMOCODE pro V can be increased step-by-step using digital modules. This allows you to:
• Input or output additional process signals and implement additional functions
• Externally supplied digital inputs can be retrofitted (24 V DC or 110–240 V AC/DC)
• Bistable relay outputs can be added – the switching status of the relay outputs is kept stable even if the power supply voltage fails

Earth fault module*
Using the earth fault module, in addition to the earth fault monitoring function integrated into the basic unit, you can configure an even more precise external earth fault monitoring using a summation current transformer.

Temperature module*
In parallel with thermistor motor protection, up to three analog temperature sensors (e.g. Pt100, Pt1000) can be integrated in your process with the help of the temperature module. This makes temperature monitoring, e.g. of bearings, gear oil or coolant, extremely easy.

Analog module*
With the analog module, the motor management system with SIMOCODE pro V can be expanded by analog inputs and outputs (0/4...20 mA). This facilitates the effortless process monitoring of filling levels, flow rates, dry running conditions or filter contamination.
SIMOCODE pro Safety – Highlights

• Combination of functional switching and fail-safe disconnection already in the motor management system – without additional expenditures

• Integration of contactor monitoring functions already in the modules

• Transfer of conclusive diagnostics information to the control

The safety-related application of components is becoming ever more important also in the field of process automation. Systems may at any time be subjected to situations which require the protection of persons or the environment by means of safety-related machine disconnection – e.g. by safe motor disconnection. In this context, SIMOCODE pro takes you to the safe side.

Apply SIMOCODE pro with a fail-safe digital module and benefit from a flexible, modular motor management system and integrated safety technology in one system. SIMOCODE pro can protect humans and machines by using a combination of different protection and monitoring functions. When a hazard occurs, it will allow for the fail-safe disconnection of respective loads. Thus, the requirements of the safety standards IEC 61508/62061 and ISO 13849-1 for functional safety of up to SIL 3 or PL e respectively are complied with.

* for SIMOCODE pro V
Safe motor disconnection is realized via the fail-safe digital module DM-F local. Functions adjustable on the module support manifold applicability.

When a fail-safe controller is employed, the DM-F local processes the controller’s fail-safe hardware signals for safe motor disconnection.

When controllers without safety function are employed, a safe sensor such as EMERGENCY-STOP can also be directly connected to the DM-F local.

**Fail-safe digital module DM-F local**

- For applications which require local fail-safe disconnection (e.g. E-STOP)
- For applications which require safe disconnection via a fail-safe hardware output of a controller.

In connection with PROFIsafe-capable SIMATIC S7 F-controllers, safe motor disconnection is directly realized via PROFIBUS or also via PROFINET to the fail-safe digital module DM-F PROFIsafe.

**Fail-safe digital module DM-F PROFIsafe**

- For applications in which the disconnection signal is generated by a fail-safe control (F-CPU) and in which the PROFIsafe profile is transferred to the DM-F PROFIsafe module via PROFIBUS or PROFINET.
Extensive functions:

**SIMOCODE pro optimizes process control and plant operation**

Whether process management, operations management or switchboards –

**SIMOCODE pro** connects all of the areas through extensive data and functions.

It provides you with advantages all the way!

### Protecting & Monitoring

**Extensive protection: multi-functional, electronic full motor protection**

**SIMOCODE pro** offers an extensive protection of the motor feeder by combining various multistage protection and monitoring functions:

**Protection functions:**
- Overload protection (Class 5–40)
- Thermistor motor protection
- Phase failure monitoring
- Unbalance protection
- Stall protection
- Earth fault monitoring
- Current limit monitoring
- Operating hours monitoring
- Motor stop time monitoring
- Number-of-starts monitoring
- And a lot more

**Expanded monitoring functions:**
- Temperature monitoring Pt100/ Pt1000*
- Voltage monitoring*
- Power monitoring*
- Cos-phi/power factor monitoring*
- Phase sequence detection*
- Input, output and monitoring of 0/4...20 mA signals*

**Recording of measured curves***

### Controlling

**Absolutely flexible: Integrated control functions**

**SIMOCODE pro** already has many pre-defined motor control functions – including all of the necessary interlocks.

Your advantage: You save a whole lot of hardware and wiring and obtain a motor feeder that is highly standardized regarding its circuit diagrams.

**Control functions:**
- Direct on-line starter
- Reversing starter
- Star-delta starter*
- Star-delta starter with reversal of rotational direction*
- Two speeds, motors with separate windings (pole changing) also with reversal of rotational direction*
- Two speeds, motors with separate Dahlander windings, also with reversal of rotational direction*
- Solenoid valve actuation*
- Positioner actuation*
- Circuit-breaker control
- Soft starter actuation*
- Soft starter actuation with reversal of rotational direction*

**Easy adjustability by means of logic blocks and standard functions:**

Further protection and control functions can be flexibly adjusted to your motor feeder’s requirements by means of freely parameterizable logic blocks such as truth tables, counters or edge evaluation as well as via standard functions such as mains failure monitoring*, emergency start-up or external faults. Arithmetic functions additionally support the conversion of measured values into any desired formats or units.

* for SIMOCODE pro V
SIMOCODE pro provides you with all of the data required for process and plant operation. This data is available in the switchboard and, to the same extent, also in the supervisory control system. In addition to the many process quantities, it is especially the service and diagnostics data that support your service and maintenance personnel. SIMOCODE pro helps you to identify approaching faults and avoid them using preventive measures. However, if a fault actually occurs, then it can be quickly localized and resolved. This means that downtimes are limited to a minimum or don’t even occur in the first place.

### Safety functions

**Optimum safety:**
- Fail-safe disconnection up to SIL 3 (IEC 61508/62061) or PL e with Category 4 (ISO 13849-1) via PROFIBUS/PROFINET/PROFIsafe or via hardware signal
- Flexible, parameterizable safety relay function

### Data acquisition and communication

**Communication via PROFIBUS/PROFINET:**
- Global availability of comprehensive data

#### Operational data:
- Motor switching state (on, off, counter-clockwise, clockwise, slow, fast)
- Current in phases 1, 2, 3 and maximum current
- Phase voltage 1, 2, 3*
- Active power*
- Apparent power*
- Power factor*
- Phase unbalance
- Phase sequence*
- Time to trip
- Temperature rise, motor model
- Remaining cooling time of the motor
- Temperature (e.g. motor temperature)*
- Actual value, analog signals*
- PROFlenergy data*:
  - Currents
  - Voltages
  - Active and apparent power
  - Power factor
  - Energy
- And much more

#### Service data:
- Motor operating hours
- Motor stop times
- Number of motor starts
- Number of overload trips
- Internal comments saved in the device
- Device operating hours
- Consumed power*
- Time interval until the next safety function test*
- And much more

#### Diagnostics data:
- Numerous detailed early warning and fault messages, also for further processing in the device or in the master control system
- Device-internal fault and event log with time stamp
- Value of the last tripping current
- Checkback faults (e.g. no current flowing in the main circuit after an On control command)
- Signaling of the fail-safe disconnection function’s test requirements*
- And much more
Comprehensive diagnostics and control options:

SIMOCODE pro for maximum system availability

More transparency, more data:

More transparency, more data: optimum process control for all process control systems using SIMOCODE pro

Today, also the motor feeder’s data are integrated in the process control system in addition to sensor data. SIMOCODE pro provides these data to all process control systems via PROFIBUS or PROFINET. SIMOCODE pro thus increases the transparency of your processes and ensures a considerably increased information density in the control system without additional costs. The data are uniformly and consistently integrated on the basis of Totally Integrated Automation. Standardized motor blocks ensure eased integration and handling.

User-friendly integration into the SIMATIC PCS 7 process control system

User-friendly integration into the SIMATIC PCS 7 process control system

SIMOCODE pro can be easily and comfortably integrated in the SIMATIC PCS 7 process control system. Standardized motor blocks and faceplates for motor control, operation and monitoring are available for this purpose.

In addition, the maintenance-relevant monitoring functions and alarms parameterized in SIMOCODE pro can be directly displayed on a central maintenance station. The power values detected by SIMOCODE pro for each motor feeder furthermore represent the optimum basis for superior power management with SIMATIC PCS 7 powerrate.

Integration into SIMATIC PDM

Integration into SIMATIC PDM

For system-wide device parameterization and diagnostics, SIMOCODE pro is also integrated in SIMATIC PDM (PDM = Process Device Manager). As a result, a uniform tool for intelligent field devices such as SIMOCODE pro is available in the process control system.
System operators are increasingly also expecting information for comfortable operations control which is centrally available in addition to process control. With SIMOCODE ES, the SIMOCODE pro system amongst others also offers a tool for the display and evaluation of all of these data.

Moreover, the manufacturer-independent OPC UA communication interface integrated in SIMOCODE pro for PROFINET supports easy and comfortable access to measured values and data – according to the operator’s individual requirements.

Diagnostics and maintenance with SIMOCODE ES

SIMOCODE pro is comfortably parameterized and diagnosed centrally via PROFIBUS/PROFINET or directly on the control cabinet by means of SIMOCODE ES. Thanks to the display of all operating, service and diagnostics data of the motor feeder, SIMOCODE ES provides conclusive information in maintenance or fault cases. It supports fault prevention as well as fast localization and rectification in case of faults. The optional online parameterization also during ongoing operation does away with unnecessary system downtimes.

Among other things, the following data is displayed in easy-to-understand dialog boxes:
- Warnings, faults, messages
- Motor operating hours, motor starts
- Error log/error history
- Trends and measuring curves

Integration into SIMATIC S7 with the object manager for SIMOCODE pro

Our OM SIMOCODE pro object manager is part of SIMOCODE ES and allows SIMOCODE ES to be incorporated in STEP 7. Devices can be configured, unified with S7, and parameterized simply because SIMOCODE ES can be directly executed from STEP 7. This means that SIMOCODE pro is “totally integrated” into SIMATIC S7.
Integrated web diagnostics:
Online access to diagnostics data, measured values, service and statistical data without additional software

The web diagnostics function integrated in SIMOCODE pro for PROFINET facilitates global access to all important online information for diagnostics and service purposes. Relevant data can even be accessed by a PC with standard web browser. Either directly on-site or remotely via the Internet.
Detailed status information on the motor, current measured values such as current and power, fault memory as well as service and statistical data can be transparently displayed via device-internal websites.

Open, manufacturer-independent communication via OPC UA: Direct data exchange with HMI panels or SCADA systems

With OPC UA, SIMOCODE pro offers a flexible and powerful communication interface via Industrial Ethernet for automation as well as operation and monitoring systems. Acting as OPC UA client, these systems can access all important operating, service and diagnostics data of SIMOCODE pro for PROFINET and transfer control commands via the integrated OPC UA server.

Thanks to the web server integrated in SIMOCODE pro for PROFINET, comfortable access to the device's diagnostics messages is also possible without any extra software, simply by using a standard web browser.
Easy planning, high degree of engineering security, fast commissioning:
SIMOCODE pro in the switchboard

With its modular and space-saving design, SIMOCODE pro is particularly suitable for application in low-voltage power distribution boards and motor control centers. The comprehensive functions of SIMOCODE pro can be flexibly adjusted to any customer-specific motor feeder design. The optional expansion modules provide additional reliability in terms of configuration.

The integrated control functions make additional interlocking hardware unnecessary. Such standardized load feeders facilitate decisively eased planning and construction processes. Moreover, ergonomic tools such as SIMOCODE ES are required for time-saving power distribution board commissioning. In addition, SIMOCODE pro can also be comfortably configured via the TIA Portal by means of STEP 7.

**Power distribution board parameterization and commissioning via SIMOCODE ES and the graphical editor**

Control and protection functions as well as control circuit wiring are integrated in SIMOCODE pro by means of integrated control functions and can be parameterized in a user-friendly and rapid manner via SIMOCODE ES. The integrated print function supports the documentation of all parameters in accordance with DIN EN ISO 7200. Moreover, the graphical editor for SIMOCODE ES facilitates easy parameterization via drag & drop: For example, inputs and outputs of function blocks can be graphically "wired" or parameters can be set. The configured functions can be described in detail in customer-specific comments and the device parameterization can be graphically documented. This greatly accelerates the commissioning process further and significantly eases documentation.

**Power distribution board parameterization and commissioning via the TIA Portal**

SIMOCODE pro can be configured and commissioned in the TIA Portal without any additional software as the device configuration already forms part of STEP 7. The SIMOCODE pro components can be intuitively selected from the hardware catalog via drag & drop and the device parameters can be set in context-sensitive dialogs. The resulting configuration is loaded into the control and automatically transferred to the SIMOCODE pro devices connected via PROFIBUS/PROFINET.
Optimum applicability:
SIMOCODE pro with SIVACON S8

The SIVACON S8 low-voltage power distribution board sets new standards as energy distribution board or motor control center (MCC) for industrial applications or for infrastructure applications up to 7,000 A. SIMOCODE pro provides a flexible and communication-capable motor management system for low-voltage power distribution boards.

For perfect interaction
SIMOCODE pro is employed in SIVACON S8 boards in universal mounting design, fixed-mounted design plug-in design or withdrawable design and facilitates the assembly of powerful and extremely space-saving communication-capable load feeders. Thanks to the initialization module for SIMOCODE pro, power distribution board and motor management system grow together even more closely.

With the withdrawable design frequently employed in motor control centers, the initialization module is permanently integrated in the power distribution board. As a result, feeder-related parameter and address data are precisely assigned to the respective feeder. When replacing the withdrawable module with SIMOCODE pro, the new component is automatically initialized with the correct parameters. This makes manual programming after device replacement a thing of the past.
Your project in excellent company:

SIMOCODE pro put into practice

Comprehensive diagnostics easily realized

The paper machine 4 by the Swabian paper manufacturer Lang domiciled in Ettingen produces approximately 500 tons of uncoated paper daily. Within the scope of a modernization, the decision-makers sought a possibility of connecting this machine to the new SIMATIC PCS 7 process control system in an efficient and future-proof manner. SIMOCODE pro offered the optimum solution. 130 electric drives in the raw material processing section are now controlled by the motor management system and are connected to the control system via PROFIBUS. The advantages for the paper production process are enormous. All motor feeders cannot only be switched and protected, but are now also reliably integrated in a comprehensive diagnostics concept. As a result, the behavior of each individual drive can be consistently and promptly monitored via the control station.

All benefits at a glance

• Easy, cost- and space-saving realization of a comprehensive diagnostic concept
• High bus quality and transfer speed
• More precise and rapid fault localization and rectification thanks to detailed diagnostics
• Enhanced flexibility for plant expansions and device replacements
• Increased productivity

“It is extremely advantageous for the entire paper manufacturing process to be able to monitor the behavior of every single drive from the control center.”

Helmut Lieberg, Qualified Engineer for Measuring and Control Technology at Lang Papier
Targeted motor management prevents process faults

The time between September and December is the high season for sugar. Particularly during these four months, it is vital for sugar producers to handle 24-hour shifts without interruptions. Therefore, Südzucker AG, which is situated in the Swabian town of Rain am Lech, opted for a modernization of diverse plant sections. The core of these modernization measures was the SIMOCODE pro motor management system, which allows for a precise control and monitoring of the process air.

The functionality of all motors can now be monitored at any time – either from the control center or directly on site. With SIMOCODE pro even gradients can be recorded in the devices. This newly gained transparency helps to consistently prevent faults. Furthermore, service works can be carried out efficiently thanks to the easy device replacement, which takes less than 30 seconds with the memory module.

“Like athletics, we have to consistently use the best equipment to be in top shape during the competition.”

Günter Leinfeldler, Senior Electrician at Südzucker AG

All benefits at a glance

- Flexible application even under confined space conditions – thanks to compact dimensions and the separate installation of basic unit and current measuring module
- Optimized servicing as a result of reduced response times and the pluggable memory module, which reads out and records all parameters
- Maximized plant availability – thanks to the possibility of processing and monitoring performance-specific parameters in the device by means of current/voltage measuring modules up to 690 V
- Load monitoring by calculating the active power and the power factor
A clean solution: SIMOCODE pro for reliable boiler cleaning

The Atlanta-based Clyde Bergemann Inc. is a well-known OEM supplier of state-of-the-art boiler cleaning systems. To be able to offer customers efficient and future-proof solutions for the modernization of their boiler systems, the process engineers searched for a flexible system meeting the following requirements: A modern motor management capable of reliable maintaining a high boiler performance and assuring the continuous removal of soot deposits. A solution without a permanently wired control technology. SIMOCODE pro perfectly satisfied these criteria. With its distributed design, the system features many useful additional functions which considerably ease the engineers’ work and reduce costs. As a flexible and modular system, SIMOCODE pro can be easily connected to PROFIBUS, offers a standardized interface and provides detailed operational, service and diagnostics data. It can be easily parameterized and guarantees a reliable cleaning operation even under harsh ambient conditions.

“Thanks to the numerous additional functions and diagnostic options of SIMOCODE pro, we have clearly outpaced our competitors.”

Sandeep Shah, Head of the Technology Division

All benefits at a glance

- Easy installation and maintenance
- Cost savings over the entire service life of the sootblowers
- Time savings thanks to easy parameter setting in standardized circuit diagram and hardware configuration
- Increased functional variety thanks to expansion modules
- Manual operation of the sootblowers in fault cases by means of local on-site control
- Active plant monitoring thanks to detailed diagnostics
- Precise, fast fault localization and rectification
For a constantly high beer quality:
SIMOCODE pro convinces with functional variety

The Paulaner brewery in Munich produces approximately 2.5 m. hectoliters of beer per year. 24 hours a day – seven days a week. To be able to maintain this production output and make the plant fit for the future, the decision-makers decided in favor of the modularly expandable SIMOCODE pro V system when modernizing the control technology in the filtration system. Particularly the high functional variety of SIMOCODE pro getting far beyond mere current measuring convinced the Heads of the Industrial Engineering Division at Paulaner. Thanks to the increased number of signal connections realized with connection of additional digital modules, all filtration and cooling process steps can now be centrally monitored and controlled. Process data are directly transferred to the control center. The high plant transparency assures a precise detection and fast rectification of faults as well as the configuration of standardized diagnostic routines.

“All from our point of view, the SIMOCODE pro motor management system is the only real diagnostic solution as it immediately detects pump and fan maloperation. It is exactly the motor management system we have been looking for.”
Herbert Eger, Senior Electrician at the Industrial Engineering Division at Paulaner

All benefits at a glance

• Space-saving and flexible application
• Easy device replacement
• More precise and rapid fault localization and rectification thanks to detailed diagnostics
• Unified basis for the configuration of standardized diagnostic routines
• Higher plant availability as a result of the increased control system transparency
Safe overflow protection of tanks in the process industry

According to current regulations, tanks with hazardous liquids employed in the process industry have to be equipped with an overflow protection in accordance with specific safety requirements according to IEC 61508/61511. Pumps used for the tanks’ filling have to support fail-safe disconnection in compliance with these regulations. The fact that comprehensive motor protection, functional switching as well as fail-safe motor disconnection can all be realized in a single system with SIMOCODE pro represents a particularly significant advantage. The safety function’s implementation can either be realized via local evaluation of the filling level sensors mostly approved for SIL 2 or SIL 3 in the SIMOCODE pro system or via a safety program which is centrally executed in a fail-safe control.

All benefits at a glance

- Integration of motor protection, functional and fail-safe switching in a single system
- Transparent representation of all motor characteristics in the control system
- SIL 3-certified safety function fully integrated in the standard system
## Modules and accessories:

### SIMOCODE pro – a system overview

<table>
<thead>
<tr>
<th>Basic unit, SIMOCODE pro C</th>
<th>Description: Basic component of the SIMOCODE pro C device range, 4 inputs / 3 monostable relay outputs, thermistor connection</th>
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<tbody>
<tr>
<td>Range:</td>
<td>Rated control supply voltage: • 24 V DC • 110...240 V AC/DC</td>
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<td></td>
<td>Bus communication: • PROFIBUS, 12Mbps</td>
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</table>

<table>
<thead>
<tr>
<th>Basic unit, SIMOCODE pro V</th>
<th>Description: Basic component of the SIMOCODE pro V device range, 4 inputs / 3 monostable relay outputs, thermistor connection, functionally expandable by expansion modules</th>
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<tbody>
<tr>
<td>Range:</td>
<td>Rated control supply voltage: • 24 V DC • 110...240 V AC/DC</td>
</tr>
<tr>
<td></td>
<td>Bus communication: • PROFIBUS, 12Mbps • PROFINET, 100Mbps</td>
</tr>
</tbody>
</table>

### Current measuring modules and current/voltage measuring modules*

<table>
<thead>
<tr>
<th>Description:</th>
<th>The motor current in the main circuit is measured separately from the basic unit using a measuring unit. Current/voltage measuring modules also measure voltages up to 690 V in the main circuit.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range:</td>
<td>Straight-through current transformer for rated motor currents: • 0.3...3 A • 2.4...25 A • 10...100 A • 20...200 A</td>
</tr>
<tr>
<td></td>
<td>Current transformer with busbar connections for rated motor currents: • 20...200 A • 63...630 A</td>
</tr>
<tr>
<td></td>
<td>The matching 3UF18 intermediate current transformers are available to measure and monitor motor currents up to 820 A.</td>
</tr>
</tbody>
</table>

### Operator panels

| Description: | For SIMOCODE pro operation at the control cabinet door with up to 10 LEDs for status display and up to 5 pushbuttons. The SIMOCODE pro V series is optionally available with display. |

### Expansion modules*

#### Digital modules

<table>
<thead>
<tr>
<th>Description:</th>
<th>To expand a basic unit by additional digital I/Os; a maximum of 2 digital modules can be connected per basic unit.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range:</td>
<td>Relay outputs: • Monostable • 24 V DC • Bistable • 110 ... 240 V AC/DC</td>
</tr>
</tbody>
</table>

#### Earth fault module

| Description: | To expand the basic unit by one input for the external earth fault detection with a summation current transformer, a maximum of 1 earth fault module can be connected per basic unit. |

#### Temperature module

| Description: | For expansion of the basic device by inputs for up to 3 temperature sensors (Pt100, Pt1000, KTY, NTC), a maximum of one temperature module can be connected per basic unit. |

#### Analog module

| Description: | To expand the basic unit with two passive analog inputs and one output (0/4...20 mA), maximally one analog module can be connected per basic unit. |

### Fail-safe expansion modules*

#### Fail-safe digital module DM-F local

| Description: | For fail-safe disconnection via hardware signal, attainable SIL 3 (IEC 61508/62061) or PL e with Category 4 (ISO 13849-1) |

#### Fail-safe digital module DM-F PROFiSafe

<table>
<thead>
<tr>
<th>Description:</th>
<th>For fail-safe disconnection via PROFIBUS or PROFINET by means of PROFiSafe profile, attainable SIL 3 (IEC 61508/62061) or PL e with Category 4 (ISO 13849-1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range:</td>
<td>Rated control supply voltage: • 24 V DC • 110...240 V AC/DC</td>
</tr>
</tbody>
</table>

* for SIMOCODE pro V
<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decoupling module</td>
<td>For current/voltage measuring modules for the detection of voltage in non-grounded mains</td>
<td></td>
</tr>
<tr>
<td>Memory module / initialization module*</td>
<td>Support of a system's complete parameterization back-up and transfer to a new system without additional auxiliary means and without detailed device knowledge, e.g. in case of device replacement. The initialization module can be installed in the motor control center's withdrawable unit in a stationary manner. The motor feeder's correct parameters are thus always supplied in case of withdrawable unit replacement.</td>
<td></td>
</tr>
<tr>
<td>Addressing plug</td>
<td>To assign a PROFIBUS address without PC/PG at a basic unit by plugging into the system interface</td>
<td></td>
</tr>
<tr>
<td>Door adapter</td>
<td>To feed out the system interface, e.g. from a control cabinet; this makes the system interface more easily accessible when parameterizing or troubleshooting using a PC/PG</td>
<td></td>
</tr>
<tr>
<td>Connection cable</td>
<td>To connect the basic unit, current measuring or current/voltage measuring module, operator panel or expansion modules</td>
<td>In various lengths</td>
</tr>
<tr>
<td>PC cable</td>
<td>For PC / programming device communication with SIMOCODE pro via the system interface</td>
<td>PC cable for serial or USB interface</td>
</tr>
</tbody>
</table>
| SIMOCODE ES                   | Parameterization and service software for SIMOCODE pro, executable under Windows XP / Windows 7                                                                                                                                                                                                       | • SIMOCODE ES Basic for parameterization / diagnostics via system interface on the device  
• SIMOCODE ES Standard for parameterization / diagnostics via system interface on the device with integrated graphical editor  
• SIMOCODE ES Premium for parameterization / diagnostics via PROFIBUS/PROFINET or system interface on the device with integrated graphical editor |                                                                       |
| PCS 7 function block library  | To integrate SIMOCODE pro into the PCS 7 process control system                                                                                                                                                                                                                                       | Various license models and PCS 7 versions                             |
Safety note:
When connecting an internal system to an external system, suitable protective measures have to be taken to ensure safe system operation (amongst others with regard to IT security, e.g. network segmentation).

Further information is available at: siemens.com/industrialsecurity